

WHAT IS CLAIMED IS:

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1. An apparatus for handling special windows in a display, comprising:  
a window manager to embed special window information in a video  
signal; and  
5 a window decoder to extract said special window information from  
said video signal and responsively generate a display control  
signal.
  2. The apparatus of claim 1, wherein said window manager is included in  
10 an operating system to simplify application software development.
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3. The apparatus of claim 1, wherein said window decoder is implemented  
as an application-specific integrated circuit.
  - 15 4. The apparatus of claim 1, further comprising:  
a target area in said special windows to be specially processed in  
response to said display control signal; and  
a video interface to transmit data including said special window  
information to said display.

5. The apparatus of claim 4, further comprising:

pixels contained in said display;

a first color signal serving as a video clock signal for said special window information; .

5 a second color signal including said special window information;

and

91 a third color signal.

6. The apparatus of claim 5, further comprising:

10 key signals including a pattern of bits of said special window information to encode a target area position, and corresponding to a pattern of said pixels depicted in said display.

7. The apparatus of claim 5, further comprising:

15 pixel pairs in said display, each member pixel of said pixel pairs being proximately located, said pixel pairs being colored according to said first color signal, said second color signal, and said third color signal in an additively complementary manner to visually approximate a single pixel of a mixed color.

8. The apparatus of claim 6, wherein components of said key signals include:

a start sequence indicating a beginning of said key signals;  
a code sequence distinguishing said key signals from said data;  
5 a horizontal offset sequence indicating a boundary of said target area relative to a horizontal position of said key signals;  
a vertical offset sequence indicating a second boundary of said target area relative to a vertical position of said key signals;  
a CRC checksum verifying said horizontal offset sequence and said  
10 vertical offset sequence; and  
a stop sequence indicating an end of said key signals.

9. The apparatus of claim 8, further comprising:

nondifferential key signal data indicating said start sequence and  
15 said stop sequence; and  
differential key signal data indicating remaining components of said key signals.

10. The apparatus of claim 8, further comprising:

20 a number sequence indicating a number of special windows.

11. The apparatus of claim 8, further comprising:

a shape sequence indicating a shape of said target area when said target area is not rectangular.

5 12. The apparatus of claim 8, further comprising:

a selection sequence indicating a selection from among a plurality of available special processes.

10 13. The apparatus of claim 6, wherein scroll bars in said special windows function as controls for special processing.

14. The apparatus of claim 6, wherein said key signals include hidden watermarks.

15 15. The apparatus of claim 6, wherein said key signals include visibly apparent symbols.

16. The apparatus of claim 6, further comprising:

key signal verification circuits identifying said special windows and  
responsively enabling an attribute;

a vertical counter monitoring a number of vertically scanned lines  
of said pixels occurring after a vertical synchronization  
signal;

a horizontal counter monitoring a number of horizontally scanned  
pixels after a horizontal synchronization signal;

registers storing said target area position in terms of said vertically  
scanned lines and said horizontally scanned pixels when  
said attribute is enabled;

a comparator monitoring a position of said pixels in terms of said  
vertically scanned lines and said horizontally scanned pixels,  
comparing said position of said pixels to said target area  
position, and responsively generating said display control  
signal to enable special processing.

17. The apparatus of claim 16, further comprising:

an internal logic clock signal denoting an intended duration for  
said special processing of said pixels in said target area; and  
a frequency control unit synchronizing said internal logic clock  
signal to said video clock signal to regulate a horizontal  
width of said pixels in said target area with a duration of  
said display control signal, thereby calibrating said special  
processing with a scan of said display.

18. The apparatus of claim 17, wherein said key signal verification circuits  
enable said attribute when a duration of said key signals in terms of  
internal logic clock signal periods is consistent with a key signal format.

19. The apparatus of claim 16, wherein said attribute is disabled by an  
absence of said key signals.

20. The apparatus of claim 16, wherein said key signal verification circuits  
enable said attribute when said key signals exist during one scan of said  
display and persist for a number of scans of said display.

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21. A method for handling special windows in a display, comprising the steps of:

embedding special window information in a video signal;

extracting said special window information from said video signal

5 using a window decoder; and

generating a display control signal in response to said window information to enable different processing of said special windows in said display.

10 22. The method of claim 21, wherein said step of embedding is performed by a window manager that is included in an operating system to simplify application software development.

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15 23. The method of claim 21, wherein said window decoder is implemented as an application-specific integrated circuit.

24. The method of claim 21, further comprising the steps of:

specially processing a target area in said special windows in

response to said display control signal; and

20 transmitting data including said special window information to said display using a video interface.

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25. The method of claim 24, further comprising the steps of:

depicting pixels in said display;

transmitting a first color signal serving as a video clock signal for

said special window information;

5 transmitting a second color signal including said special window  
information; and

9 transmitting a third color signal.

26. The method of claim 25, further comprising the step of:

10 transmitting key signals including a pattern of bits of said special  
window information to encode a target area position, and  
corresponding to a pattern of said pixels depicted in said display.

27. The method of claim 25, further comprising the step of:

15 depicting pixel pairs in said display, each member pixel of said  
pixel pairs being proximately located, said pixel pairs being colored  
according to said first color signal, said second color signal, and  
said third color signal in an additively complementary manner to  
visually approximate a single pixel of a mixed color.



28. The method of claim 26, wherein said step of transmitting said key signals further comprises the step of concurrently transmitting within said key signals:

a start sequence indicating a beginning of said key signals;

5 a code sequence distinguishing said key signals from said data;

a horizontal offset sequence indicating a boundary of said target

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area relative to a horizontal position of said key signals;

a vertical offset sequence indicating a second boundary of said

target area relative to a vertical position of said key signals;

10 a CRC checksum verifying said horizontal offset sequence and said

vertical offset sequence; and

a stop sequence indicating an end of said key signals.

29. The method of claim 28, further comprising the steps of:

15 transmitting nondifferential key signal data indicating said start

sequence and said stop sequence; and

transmitting differential key signal data indicating remaining

components of said key signals.

30. The method of claim 28, further comprising the step of:  
transmitting a number sequence indicating a number of special  
windows.

5 31. The method of claim 28, further comprising the step of:  
transmitting a shape sequence indicating a shape of said target  
area when said target area is not rectangular.

10 32. The method of claim 28, further comprising the step of:  
transmitting a selection sequence indicating a selection from  
among a plurality of available special processes.

15 33. The method of claim 26, wherein scroll bars in said special windows  
function as controls for special processing.

34. The method of claim 26, wherein said key signals include hidden  
watermarks.

20 35. The method of claim 26, wherein said key signals include visibly  
apparent symbols.

36. The method of claim 26, further comprising the steps of:

identifying said special windows and responsively enabling an

attribute using key signal verification circuits;

monitoring a number of vertically scanned lines of said pixels

5 occurring after a vertical synchronization signal using a  
vertical counter;

monitoring a number of horizontally scanned pixels after a

horizontal synchronization signal using a horizontal counter;

using registers to store said target area position in terms of said

10 vertically scanned lines and said horizontally scanned pixels  
when said attribute is enabled;

using a comparator to monitor a position of said pixels in terms of

said vertically scanned lines and said horizontally scanned

pixels, to compare said position of said pixels to said target

15 area position, and to responsively generate said display

control signal to enable special processing.

37. The method of claim 26, further comprising the steps of:

denoting an intended duration for said special processing of said  
pixels in said target area using an internal logic clock signal;  
and

5 using a frequency control unit to synchronize said internal logic  
clock signal to said video clock signal and regulate a  
horizontal width of said pixels in said target area with a  
duration of said display control signal, thereby calibrating  
said special processing with a scan of said display.

10 38. The method of claim 36, wherein said key signal verification circuits  
enable said attribute when a duration of said key signals in terms of  
internal logic clock signal periods is consistent with a key signal format.

15 39. The method of claim 36, wherein said attribute is disabled by an absence  
of said key signals.

40. The method of claim 36, wherein said key signal verification circuits  
enable said attribute when said key signals exist during one scan of said  
20 display and persist for a number of scans of said display.

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The method of claim 26, wherein said step of transmitting said key signals further comprises the steps of:

transmitting a start sequence indicating a beginning of said key signals;

5 transmitting a code sequence distinguishing said key signals from said data;

transmitting a horizontal offset sequence indicating a boundary of said target area relative to a horizontal position of said key signals;

10 transmitting a vertical offset sequence indicating a second boundary of said target area relative to a vertical position of said key signals;

transmitting a CRC checksum verifying said horizontal offset sequence and said vertical offset sequence; and

15 transmitting a stop sequence indicating an end of said key signals.

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42. A system for handling special windows in a display, comprising:
- means for embedding special window information in a video signal;
  - means for extracting said special window information from said video signal; and
  - 5 means for responsively generating a display control signal.

43. A computer-readable medium comprising program instructions for handling special windows in a display by performing the steps of:
- embedding special window information in a video signal using a
  - 10 window manager;
  - extracting said special window information from said video signal using a window decoder; and
  - responsively generating a display control signal.

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